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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,284	12/03/2003	J. Scott Price	GEMS 0136 PUS	1283
27256	7590	03/10/2005	EXAMINER	
ARTZ & ARTZ, P.C. 28333 TELEGRAPH RD. SUITE 250 SOUTHFIELD, MI 48034			KAO, CHIH CHENG G	
			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/707,284

Applicant(s)

PRICE ET AL.

Examiner

Chih-Cheng Glen Kao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/3/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: (paragraphs 24, 26, and 29, electron beam “40”), (paragraph 36, line 1, “step 100”), (paragraph 37, line 1, “step 102”), (paragraph 38, line 1, “step 104”), (paragraph 39, line 1, “step 106”), and (paragraph 40, line 1, “step 108”). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the source window allowing direct electron emission to pass through and preventing indirection electron emissions from passing through must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing

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sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

3. The disclosure is objected to because of the following informalities, which appear to be minor draft errors.

In the following format (location of objection; suggestion for correction), the following corrections may obviate their respective objections: (paragraph 7, line 9, “caused bys spit”; replacing “bys” with - -by- -), (paragraph 7, line 9, “arcing, low-Z gases”; replacing the comma with a period and replacing “low-Z” with - -Low-Z- -), and (paragraph 26, lines 1-2, “low-pressure cavity 50”; replacing “50” with - -58- -).

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Wakalopulos (US Patent 5612588).

Wakalopulos discloses an apparatus comprising a source housing (fig. 1, #18) comprising a source window (fig. 1, #20) having a first voltage potential (fig. 2, #57), a source electrode having a second voltage potential and generating electrons (fig. 2, #22), said source electrode emitting said electrons through said source window (fig. 2, #20).

Note that the functional recitation of emitting electrons to a target external to a source housing has not been given patentable weight because it is narrative in form.

5. Claims 1, 4, 6, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakamura et al. (US Patent 5517545).

6. Regarding claim 1, Nakamura et al. discloses an apparatus comprising a source housing (fig. 5, section from #11 to #12) comprising a source window (fig. 5, #12), which is a metal that would necessarily have a first voltage potential (col. 3, lines 40), a source electrode having a second voltage potential (fig. 5, #15a-15d) and generating electrons (col. 3, lines 53-54), said

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source electrode emitting said electrons through said source window to a target (fig. 5, #16a) external to said source housing.

7. Regarding claim 4, Nakamura et al. would necessarily have a source window (fig. 5, #12) allowing direct electron emission to pass through said source window to said target (fig. 5, #16a) and preventing indirect electron emission from passing through said source window (fig. 5, #12), since indirect electron emissions will have less kinetic energy and will not pass through the source window as easily compared to direct electron emissions having more kinetic energy.

8. Regarding claim 6, Nakamura et al. further discloses the source electrode as a focusing electrode (fig. 5, #15d).

9. Regarding claim 7, Nakamura et al. would necessarily have a variable potential (on and off).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. as applied to claim 1 above, and further in view of Beland (US Patent 5241260).

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Nakamura et al. discloses an apparatus as recited above. Nakamura et al. further discloses thermionic wire coil (fig. 6, #15a).

However, Nakamura et al. does not disclose tungsten.

Beland teaches tungsten (col. 1, lines 40-41).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Nakamura et al. with the tungsten of Beland, since one would be motivated to make such a modification for greater emission intensity (col. 1, lines 43-46) as implied from Beland, due to tungsten's ability to maintain integrity at high temperatures. Also note that it would have been obvious to incorporate tungsten since it would have been within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

11. Claims 8-10 and 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. as applied to claim 1 above, and further in view of Matsushita et al. (US Patent 6526122).

12. Regarding claim 8, Nakamura et al. discloses an apparatus as recited above. Nakamura et al. further discloses a grid (fig. 5, #15c) coupled between the source electrode (fig. 5, #15b) and said target (fig. 5, #16a).

However, Nakamura et al. does not disclose a grid focusing electrons.

Matsushita et al. teaches a grid focusing electrons (col. 1, lines 18-21).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Nakamura et al. with the focusing grid of Matsushita et al., since one would be motivated to make such a modification to better obtain predetermined x-rays (col. 1, lines 28-31) as implied from Matsushita et al.

13. Regarding claims 9, 10, and 17, Nakamura et al. discloses an apparatus and method as recited above. Nakamura et al. further discloses a target having a third voltage potential and decelerating electrons to generate x-rays (fig. 5, #16a).

However, Nakamura et al. does not disclose a sealed electron beam source as a complete and separate sub-assembly of an imaging tube.

Matsushita et al. teaches a sealed electron beam source as a complete and separate sub-assembly of an imaging tube (col. 1, lines 22-28).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus and method of Nakamura et al. with the beam source of Matsushita et al., since one would be motivated to make such a modification to better obtain predetermined x-rays (col. 1, lines 28-31) as implied from Matsushita et al.

14. Regarding claims 13 and 14, Nakamura et al. as modified above suggests a system as recited above.

However, Nakamura et al. does not specifically disclose a frame coupled within a tube, a low-pressured cavity fluidically coupled between the frame and a target, said cavity at least partially defined by the frame, target, and sealed electron beam source, and said cavity at least



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partially exhausted or filled with a low-pressure gas comprising at least one of a low-Z substance, helium, nitrogen, or argon.

Matsushita et al. teaches a frame (fig. 1, #31) coupled within a tube (fig. 1, #1), a low-pressured cavity (fig. 1, cavity inside #31) fluidically coupled between the frame and a target (fig. 1, #32), said cavity at least partially defined by the frame (fig. 1, #31), target (fig. 1, #32), and sealed electron beam source (fig. 1, #50), and said cavity at least partially exhausted (col. 6, lines 8-10) or filled with a low-pressure gas comprising at least one of a low-Z substance, helium, nitrogen, or argon.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus and method of Nakamura et al. as modified above with the cavity of Matsushita et al., since one would be motivated to make such a modification to produce more x-rays in a vacuum.

15. Regarding claim 15, Nakamura et al. further discloses the beam source (fig. 5, section from #11 to 12) directed at the target (fig. 5, #16a) at a glancing angle.

16. Regarding claims 16 and 18, Nakamura et al. would necessarily have a source window (fig. 5, #12) allowing direct electron emission to pass through said source window to said target (fig. 5, #16a) and preventing indirect electron emission from passing through said source window (fig. 5, #12), since indirect electron emissions will have less kinetic energy and will not pass through the source window as easily compared to direct electron emissions having more kinetic energy.

17. Claims 2, 3, 12, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. and Matsushita et al. as applied above, and further in view of Barrett (US Patent 6674838).

Nakamura et al. as modified above discloses or suggests an apparatus and method as recited above.

However, Nakamura et al. does not disclose a coolant channel housing thermally coupled to and at least partially defined by a source housing comprising a coolant channel and a coolant flowing therein, said coolant absorbing heat from the source housing, and wherein a source window further comprises feedthroughs for said coolant to flow therein and absorb heat from said source window.

Barrett teaches a coolant channel housing (fig. 1, #68) thermally coupled (fig. 1, #64) to and at least partially defined by a source housing (fig. 1, #66) comprising a coolant channel (fig. 1, #68) and a coolant flowing (col. 9, line 23) therein, said coolant absorbing heat from the source housing (fig. 1, #64 and 68), and wherein a source window (fig. 1, #58) further comprises feedthroughs (fig. 1, #68) for said coolant to flow therein and absorb heat from said source window.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus and method of Nakamura et al. as modified above with the coolant of Barrett, since one would be motivated to make such a modification to better cool the tube at specific locations compared to indirect cooling systems (col. 3, lines 62-66) as implied from Barrett.

18. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. in view of Matsushita et al. as applied to claim 10 above, and further in view of Turner et al. (US Patent Application Publication 2003/0021377).

Nakamura et al. as modified above suggests an apparatus as recited above.

However, Nakamura et al. does not disclose a third and first voltage potential approximately equal.

Turner et al. teaches a third and first voltage potential approximately equal (paragraph 51, lines 5-6).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Nakamura et al. as modified above with the potentials of Turner et al., since one would be motivated to make such a modification to make the region field free (paragraph 51, lines 5-8) and prevent erosion (paragraph 22) as shown by Turner et al.

19. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. in view of Matsushita et al. as applied to claim 17 above, and further in view of Yamamura (US Patent 4188558).

Nakamura et al. as modified above suggests a method as recited above.

However, Nakamura et al. does not disclose utilizing low pressure gas to enhance heat transfer between a target and frame of an imaging tube.

Yamamura teaches utilizing low-pressure (abstract) gas to enhance heat transfer (col. 1, lines 12-14) between a target (fig. 1, #5) and frame (fig. 1, #1) of an imaging tube.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Nakamura et al. as modified above with the gas pressure of Yamamura, since one would be motivated to make such a modification to reduce damage (col. 2, lines 62-64) as shown by Yamamura.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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